Project Part A

Objective

Over two days you will start working on **Project Part A** individually or together in group. Assignment A1 has 1 part to be completed for G-Level and the Assignment A2 has 1 part to be completed for VG-Level. You may decide to do part of the work in the group and complete it individually. In any case the project part is individual and should be send in individually. Pls send in your solutions, compressed into zip format, so I can easily un-compress them and open in Visual Studio 2019 and run the code. **Pls see deadline in "Kursplaneringen".**

The objective is to use the skills learned in Module2: Procedural Programming and C# Fundamentals to create a program where you enter some purchased products name and price and prints a receipt.

For **both assignments** I have provided some simple template in data structure and code for you to not get stuck on trivial matters as well as some hints.

Grade criterias for this part of the project:
Godkänt (G) : Completion of Assignment A1
Väl godkänt (VG): Completion of Assignment A2

Project Part A: Assignment A1

Use the Console Solution Project Part A template available in the zip file.

Assignment A1

Write a program where the user:
- Enters number of articles
- Enters each article name and price one by one until all articles are entered.
- Once all articles are entered a receipt shall be printed in tabular format listing the products and price.
- VAT should be printed on the receipt.

Below you see a screen shot of a possible solution, where I have entered 3 articles. The article name and price are separated by ";". So, for example "Bananas; 6,50" means article Bananas at price 6.50 kr.

Below is just an example and you can decide your own format and style.

```
Microsoft Visual Studio Debug Console
Welcome to Project Part A
Let's print a receipt!

How many articles do you want (between 1 and 10)?
3

Please enter name and price for article #0 in the format name; price (example Beer; 2,25):
Apples; 15,45

Please enter name and price for article #1 in the format name; price (example Beer; 2,25):
Bananas; 6,50

Please enter name and price for article #2 in the format name; price (example Beer; 2,25):
Coffee;  35,80


Reciept Purchased Articles
Purchase date: 2021-09-13 13:42:51

Number of items purchased: 3

#    Name                         Price
0    Apples                     15,45 kr
1    Bananas                     6,50 kr
2    Coffee                     35,80 kr

Total purchase:                 57,75 kr
Includes VAT (25%):             11,55 kr
```

Error handling

The program need only to have fundamental error handling that indicate if wrong input is entered and then ask the user to re-enter.

In the example below, a message is shown when wrong number of articles are entered. The user is informed and asked again and again until correct input is entered, and then the program proceeds.

Below "Q" and "Apples" were entered incorrectly when the program asked for a number between 1 and 10.

```
C:\Users\marti\Development\Visual Studio 2019\Projects\Beginner OOP\CSharp Part\ProjectPartA\ProjectPartA_G\bin\Debug\net5.

Welcome to Project Part A
Let's print a receipt!


How many articles do you want (between 1 and 10)?
Q

Wrong input, pls try again.

How many articles do you want (between 1 and 10)?
Apples

Wrong input, pls try again.

How many articles do you want (between 1 and 10)?
3

Please enter name and price for article #0 in the format name; price (example Beer; 2,25):
```
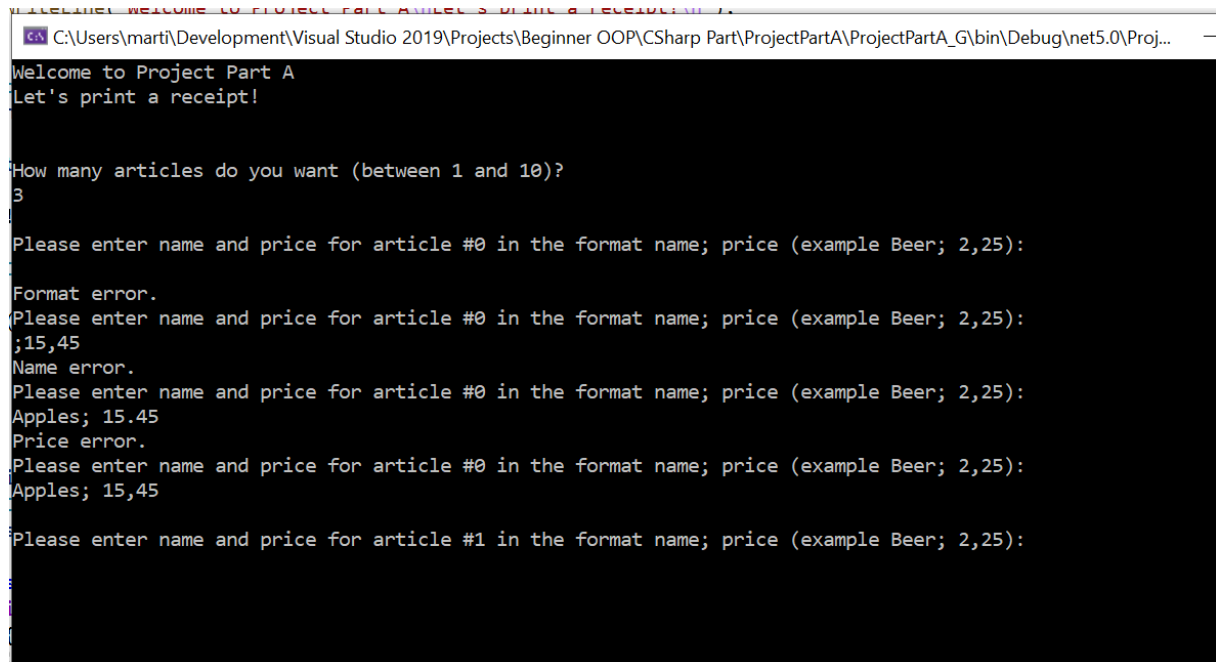
Similar, when the article is entered incorrectly the user should be informed and asked to re-enter the article.

In the example below, the user was informed of "Format error" when an empty string was given as input. The user is asked to re-enter. In the following error, the user gave wrong name (empty) but the right separator and price, hence the user was informed of a "Name error". Then in the final error, the user used "." instead of "," as a decimal separator in the price and consequently was informed of a "Price error".

Finally, the user entered name and price correctly and was then asked to enter the next article.

```
Welcome to Project Part A
Let's print a receipt!


How many articles do you want (between 1 and 10)?
3

Please enter name and price for article #0 in the format name; price (example Beer; 2,25):

Format error.
Please enter name and price for article #0 in the format name; price (example Beer; 2,25):
;15,45
Name error.
Please enter name and price for article #0 in the format name; price (example Beer; 2,25):
Apples; 15.45
Price error.
Please enter name and price for article #0 in the format name; price (example Beer; 2,25):
Apples; 15,45

Please enter name and price for article #1 in the format name; price (example Beer; 2,25):
```

Project Part A: Assignment A2

Use the Console Solution Project Part A template available in the zip file.
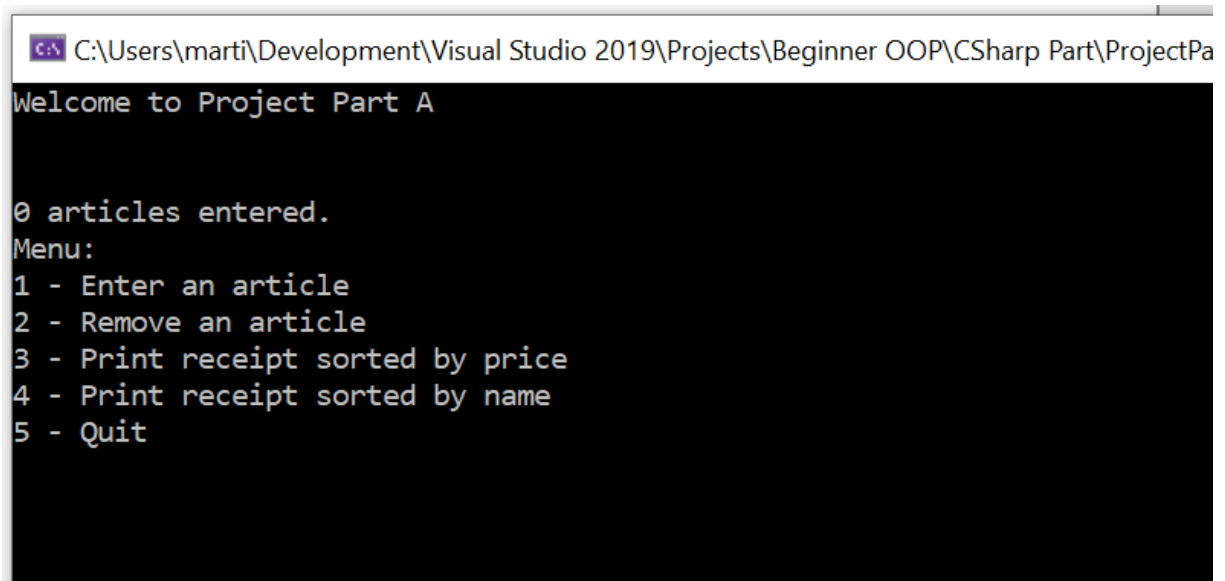
Assignment A2

Modify and extend the code from Assignment1 to make it menu driven and allowing the articles to be sorted when the receipt is printed.

Presents a menu and read the user selection. The menu should allow the user to
- Enter and article
- Remove and article
- Print a receipt sorted by Price using either SelectionSort or BubbleSort algorithms
- Quit

Also, the number of articles entered should be shown together with the menu.

An example is show below:

An example of "Menu selection 1 – Enter an article" is shown below where "Apples; 15,25" was entered followed by Bananas and Coffee.

```
C:\Users\marti\Development\Visual Studio 2019\Projects\Beginner OOP\CSharp Part\ProjectPartA\Proje

Welcome to Project Part A


0 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
1

Please enter name and price for article (example Beer; 2,25):
Apples; 15,25

1 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
1

Please enter name and price for article (example Beer; 2,25):
Bananas; 6,35

2 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
1

Please enter name and price for article (example Beer; 2,25):
Coffee; 35,50

3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
```

An example of "Menu selection 2 – Remove an article" is shown below where "Apples" was entered, leaving 2 articles left (Bananas and Coffee).

```
3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
2

Please enter name of article to remove (example Beer):
Apples

2 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
```

An example of "Menu selection 3 – Print receipt sorted by price" is shown below (Apples were re-entered using menu item 1 before printing receipt).

```
3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
3


Reciept Purchased articles sorted by price
Purchase date: 2021-09-13 14:25:11

Number of items purchased: 3

#    Name                          Price
0    Bananas                        6,35 kr
1    Apples                        15,25 kr
2    Coffee                        35,50 kr

Total purchase:                   57,10 kr
Includes VAT (25%):               11,42 kr

3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
```

Finally, an example of "Menu selection 4 – Print receipt sorted by name" is shown below.

```
3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
4


Reciept Purchased articles sorted by name
Purchase date: 2021-09-13 14:26:45

Number of items purchased: 3

#    Name                          Price
0    Apples                     15,25 kr
1    Bananas                     6,35 kr
2    Coffee                     35,50 kr

Total purchase:                57,10 kr
Includes VAT (25%):            11,42 kr

3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
```

Error handling

The program should have robust error handling using try-catch exception handling. All inputs and selections should be tested and if invalid input is given the user should be informed and brought back to the menu.

Error information should be given when:
- Entering an invalid menu selection
- trying to exceed maximum number of articles
- trying to remove articles when no articles are entered.
- When entering invalid article - empty, name or price
- When trying to remove an article not found

Example of invalid menu selection ("Q" is entered instead of 1-5).

```
3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
Q

Wrong selection, pls try again.
3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
```

Example of error when empty string is given when entering an article

```
3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
1

Please enter name and price for article (example Beer; 2,25):

Error: Article input format error.

3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
```

Example of error when a non-existing article is being removed

```
3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
2

Please enter name of article to remove (example Beer):
Honey
Error: Article Honey not found. Cannot remove.

3 articles entered.
Menu:
1 - Enter an article
2 - Remove an article
3 - Print receipt sorted by price
4 - Print receipt sorted by name
5 - Quit
```